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than three-fourths the size of the State of Texas.—Macchiati in the October *Nuovo Giornale Botanico Italiano* enumerates the orchids of Sardinia, forty-six species in all.—In the same journal, Professor Passerini continues his enumeration of the fungi of Parma. No less than thirty-two species of Peronosporæ occur in the Parmensian flora.—The re-issue of the third series of the well-known *Botanical Magazine* is announced, by the publishers, L. Reeve & Co., London.—A second edition of Elliott's "Hand-book of Landscape Gardening" has appeared from the house of D. M. Dewey & Co., of Rochester. Botanically, its chief interest lies in the numerous very poor colored plates, the publisher has added. It is to be hoped that no horse-chestnut like the one figured in this book ever existed. There can be no excuse for such wretched plates, and for the numerous typographical blunders, which disfigure the work. However, we do not doubt, that the book may be useful to many who wish to improve their grounds.

ZOOLOGY.

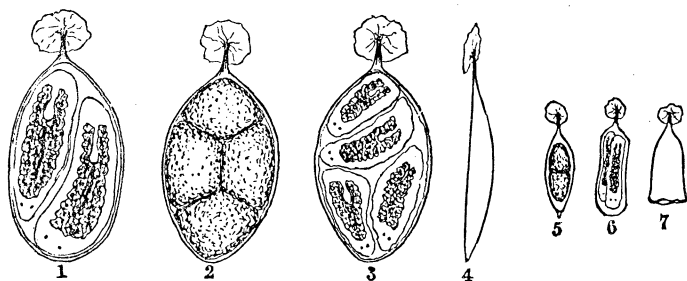
OBSERVATIONS ON THE SPECIES OF PLANARIANS PARASITIC ON LIMULUS.—During the present summer, while engaged in investigating food-fishes under the auspices of the U. S. Fish Commission, near the mouth of the Chesapeake bay, a fine large female specimen of *Limulus polyphemus* was brought to me from one of the pound nets near by, into which it had strayed. Upon making an investigation of the creature's anatomy, I discovered a great number of parasitic planarian worms infesting the gills, and adhering to the leaflets of the latter were many thousands of egg capsules, in which the young worms were undergoing development. From an inspection of a numerous series of these capsules, with the aid of the proper method of sectionizing, it would have been possible to have obtained a full history of the development of the species; for such an investigation the writer was not, however, prepared, nor did he have the time for it, but from the circumstance that there was a great diversity in the size of the capsules, he believes that at least three species of these parasites make the gills of the horse-shoe crabs their nidus. That such parasites infest this animal has apparently been known for a long time. Alexander Agassiz alludes to it under the name of *Planaria angulata* Müller, and Max Schultze in 1873, at Weisbaden, described the animal before the Congress of German Naturalists, but does not appear to have published anything in their transactions. Recently Dr. Ludwig Graff¹ has discussed the subject anew and at greater length and with more thoroughness; but he recognizes but one form, which he calls *Planaria limuli*. Dr. Graff's recognition of but one species is then the excuse for the present notice,

¹Kurze Mittheilungen über fortgesetzte Turbellarienstudien. Zoolog. Anzeiger, II, Apr., 1879, pp. 202-205.

and I take the opportunity so offered of putting my observations upon record, so as to facilitate future studies by others.

Graff says the capsules observed by him in material supplied from the Frankfurt a. M. Aquarium, by Dr. Schmidt, measured about three millimeters long by one and a half wide, which would correspond pretty nearly with the outline of the largest capsule observed by me and represented in Fig. 9. But according to him these large capsules contained from two to nine embryos, while those observed by me never contained more than one, the presumption, therefore, is, that they belong to distinct species, and that on this specimen of *Limulus*, *Planaria limuli* was not present.

All of the capsules were apparently chitinous, and attached by a cylindrical stalk to the surface of the branchial leaflets by a disk-like expansion of the end of the stalk, as represented in

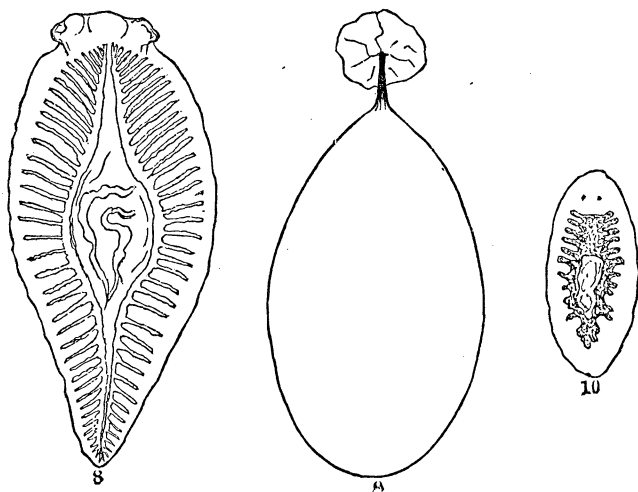


Capsules and Embryos of the *Planaria* of the Horse-shoe Crab; enlarged.

Figs. 1-7 and 9. In form the capsules are oval and flattened, lying down flat against the surface of the branchial leaflets with the plane side. The lower side of the capsule is flat, the upper convex, as shown in a side view, Fig. 4. When the young escape they find their way out by the free end of the capsule, which is ruptured as represented in Fig. 7. They are scattered all over the branchial leaflets and on both sides of them. The different sizes were often seen side by side on the same leaflets together with the parent worms, which, as Graff observes, had often eaten through the branchial structures. So extensive was this damage that I suspect they cannot be considered merely as commensals, but rather as true parasites, for it was frequently observed that four or five successive leaflets were eaten through in the vicinity of a large adult worm, so as to produce large irregular perforations with evidences of degeneration of the branchial tissues at the margins of the openings. That they should find it easy to feed off of their host is not to be wondered at, in that the branchial leaflets are composed of two very thin chitinous lamellæ which are kept apart by numerous rounded pillars; in the space between the lamellæ and around the supporting pillars the blood of the host circulates. In consequence of this arrangement, all that

our parasites need to do in order to get at the juices of their host, is to cut through the lamella next to them and they have an abundant supply of food always at hand. It appears that Van Beneden, the elder, regards them, on the authority of A. Agassiz, as messmates, but from the foregoing recital it would appear that they are more or less truly parasitic in habit. It appears that other crustaceans are infested by planarians, and Professor Leidy has described a parasitic genus, *Bdellura*.

On the specimen of *Limulus* examined by me there were three well-marked types of egg capsules. The first, represented in Figs. 1-4, enlarged sixteen times, measured about a twelfth of an inch, or about a line, in length, and usually contained from two to four embryos. The branches of the gastric cavity are separate posteriorly in the embryos, but afterward become joined, as shown in Fig. 10, supposed to be the adult of this second form. This form has a pair of eye spots developed at a very early period



Parasite of the Horse-shoe Crab ; enlarged.

which are retained when hatched. The mode of segmentation of the eggs is very difficult to make out in the capsules, as the individual ova are very strongly pigmented, and consequently almost opaque, so that the contours of the cells cannot be discerned.

The second form, represented in Figs. 5-7, enlarged sixteen times, is much smaller but similar in structural features to the preceding. The capsules measure about one-twenty-fifth of an inch in length, and contain usually two eggs or embryos. At first the ova occupy each one of the ends of the capsule, as shown in Fig. 5, but after the young worms have developed somewhat they usually lie along side of each other lengthwise of the capsule. They frequently change positions, however, at this

stage, and it sometimes happens that there is but one embryo in a capsule. The ova of this, like the preceding species are nearly opaque, and the walls of the stomach in like manner are composed of very dark granular protoplasm.

The next form of capsule observed, is that represented in Fig. 9, enlarged sixteen times, and is supposed to belong to the adult represented in Fig. 8, enlarged five and a half times. These, as stated before, were never seen to contain more than one embryo, and measure over an eighth of an inch in length. The egg is not so darkly pigmented as in the other forms. The supposed adult of this species, Fig. 8, is apparently without eyes, and the cæcal diverticula of the stomach are arranged in a paired system on either side of the median line independent of each other. The peculiar hood-like cephalic extremity may be of the nature of a sucking disk. This last form is milky white in appearance; the cæcal prolongations of the stomach, yellowish. The stomach in the other forms is dark brown, so that the two types of forms may be at once distinguished.

I do not propose to name the species, as these supposed distinct life histories may, after all our endeavors to separate them, be only phases of the same thing. Sure points of distinction can only be got by a more thorough study of these interesting types than I have been able to bestow upon them, and I leave them here in the hands of such helminthologists as may be disposed to give the subjects of this notice further attention.

I have not seen Dr. Graff's final paper, in which *P. limuli* was to be fully described and illustrated.—*John A. Ryder.*

THE CIRCULATION OF SESSILE-EYED CRUSTACEA. — Dr. Yves Delage has published in the Archives de Zoologie expérimentale et générale, a superbly illustrated and detailed memoir on the circulation of the sessile-eyed Crustacea. The plates are printed in colors, so as to bring out clearly the heart, arteries, venous sinuses and veins; moreover, sections of the body are given, so that the topography of the circulatory system is given in a graphic manner. The memoir is too long for abstract, but it is one of the most valuable contributions of the past year to our knowledge of the Crustacea. The circulation appears to be on much the same plan as in the Decapods.

VIVIPAROUS CHIRODOTA.—A Brazilian species of this genus of Holothurians, or sea-cucumbers, has been found by Professor H. Ludwig to be viviparous. The genital tubes appear to give rise to both eggs and spermatozoa, the latter being developed in their blind ends and lateral bunches. The young to the number of sixteen, and all of the same stage of development, were found lying freely in the body-cavity. They had seven tentacles, two of them minute, and in the body-wall were groups of developing or developed calcareous wheels.

A MARINE PLANARIAN AND ITS HABITATION.—In June, 1881, a very large female specimen of the common horse-shoe crab (*Limulus polyphemus*) came into my hands,¹ on the gills of which I observed a number of brown small bodies like seeds of some plant, together with living whitish worms, a dendrocœlous Planarian, the *Bdelloura candida* Girard.²

These worms were of various sizes, the largest (Fig. 1; side), measuring 16^{mm} in length and about 6^{mm} in width, by about 1^{mm} in thickness. They moved slowly and snail-like over the large lamellous gills, their body-margin, especially the anterior portion, having undulating motions, these being respiratory movements. On placing them in alcohol they became considerably wrinkled

and contracted. The larger ones had neither cephalic notches (which occur in some members of this family), nor eye-dots. The dorsal side showed a faint line running along and close to the entire margin. A large round muscular bag occasionally protruded³ from a little behind the middle of the ventral surface; this is the pharynx.

In alcoholic specimens a second roundish smaller opening could be seen a little behind the pharynx, the genital orifice. The alimentary system had about ten or eleven lateral sacs.

The seed-like brown bodies found together with the Planarians, I immediately took for their egg-cases, which proved to be correct upon opening some of them whence one or two young Planarians could be taken. They were of a cream color and more transparent than their parents. But strange enough, they had a pair of distinct eye-dots, which, I presume, in the adult have degenerated.

FIG. 1.—Young Planaria, 3mm long, extended. *oc*, eyes; *z*, alimentary system with lateral sacs; *m*, pharynx opening; *g*, male genital glands; *gs*, genital orifice. Figure at the side represents size and form of an adult Planaria.

The pharynx, the genital orifice and even the genital gland (Fig. 1 *g*) could be recognized. From analogy, I infer the latter to be the male organs, the female glands having escaped my observation, since our worm is hermaphroditic. The movements of these young worms were more rapid than in the older ones.

The egg-cases were of various sizes, by far the greatest number, however, being 3.50^{mm} in length (excluding the stem), by 1.50^{mm} in width. They were plano-convex, the latter exteriorly, the former towards the gills. They consisted of a brown, homo-

¹ From Theo. C. Hepp, M.D., Brooklyn, N. Y.

² Identified by Professor A. S. Packard, Jr.

³ In alcoholic specimens in every case.

geneous, thick and leathery mass, either ovoid or cup-shaped, some of them having a sort of a lid on their tip.

Within many of them were the young Planarians, free, moving about, from one to three individuals in each capsule, in others the same were again enclosed within a similar oval case without stem, and again others were found with their tip broken off and empty. The greater number of them were covered around their tip with bluish (colorless in alcoholic specimens) ten-pin-shaped tubes with open tips. As these tubes were invariably on or near the tip of the capsules only, they cannot be taken for parasitic organisms, but may presumably be openings for an exchange of oxygenized water for the enclosed offspring. Those capsules having no such tubes, probably got them rubbed off through the motions of the gills of the *Limulus*. A few specimens of this Planarian, from three to five millimeters in length, the size usually found only within the capsules, were amongst the larger ones creeping around. These must have just left their protecting homes.—*Carl F. Gissler, Ph.D.*

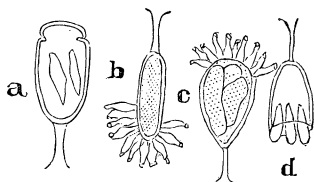


FIG. 2.—a, egg capsule with a lid, enclosing two encased embryos; b, egg-capsule with one free young enclosed, capsule with air-tubes (?) around tip; c, ordinary form of egg-capsule, enclosing three young Planarians; d, empty egg-capsule with three empty cases near orifice.

EYE OF PLANARIANS.—Professor R. Hertwig finds that the nervous system of these worms is very primitive in character, and is but slightly separated off from the surrounding tissue; in the eye it is possible to distinguish a black pigmented and a clear colorless portion. The former lies along the animal's axis; the latter is just below the epithelium, and is only separated from it by the basal membrane. The pigmented portion, again, consists of two parts, a transparent nucleus (vitreous body) and a superficial layer of surrounding pigment cells, which are only wanting at the diaphragm-like point at which the retina or colorless part is connected with the rest. The cylindrical fibers of the vitreous body are arranged parallel to one another, the nucleated ends being nearest the pigment. The retina is only formed of optic cells, which are continued at one end into a nerve-fiber, and at the other into a rod-like process. The fibers of the optic nerve traverse the retina in a very irregular manner, so that there is no regular arrangement of the optic cells.

THE STRUCTURE AND AFFINITIES OF THE HIPPOPOTAMUS.—In a recent illustrated paper, entitled "Observations upon the Hippopotamus," by Professor H. C. Chapman, published in the Proceedings of the Academy of Natural Sciences of Philadelphia, the author gives a résumé of what has been published upon the general anatomy of this animal, of which he dissected an adult male and female

of the ordinary *Hippopotamus amphibius*, which died during the year past in this country. He figures the brain, alimentary and reproductive systems, and adds much of importance to our knowledge of this great beast. In conclusion, he thus remarks on the natural affinities of the hippopotamus with the Ungulata and other mammals, especially the manatee. "In observing the manatee that lived for several months in the Philadelphia Zoölogical Garden, the manner in which it rose to the surface of the water to breathe reminded me often of the hippopotami that I watched in the Zoölogical Garden of London and the Jardin des Plantes in Paris. The slow way in which the animals rise to the surface, the motionless pose of the almost sunken body, the nostrils often just appearing at the surface, etc., are very much alike in both animals. In speaking of the alimentary canal, I called attention to the stomach of the manatee, which represents that of the hippopotamus in an atrophied condition, while, on the other hand, the stomach of the hippopotamus is intermediate between the peccary and the ruminants. As regards the heart, it will be remembered that in the young hippopotamus, at least, it is bifid, resembling in this respect that of the manatee. The female generative apparatus of the peccary and hippopotamus are almost identical. Again, the sexual vesicles are found in both hippopotamus and manatee. While the placenta does not appear to me to have the importance attached to it by some authors as a guide in determining the affinities of animals, it is proper to mention in this connection that according to Milne Edwards and Garrod the placenta of the hippopotamus is diffuse, and appears to be non-deciduous, and such is the case, according to Harting, in the dugong, and therefore in the manatee, probably, for, as a matter of fact, the placentation of the manatee is unknown.

"While the brain of the hippopotamus appears to be a modification of a type common to the pig, peccary, sheep, ox, giraffe, etc., it has also, it seems to me, affinities with that of the manatee. In a word, then, beginning with the pig, we pass by an easy transition to the peccary, which leads to the hippopotamus, and thence, in diverging lines, to the Ruminantia on the one hand, and the manatee on the other. Palæontologists have not discovered a form which bridges over the gap between the hippopotamus and the manatee, but it will be remembered that certain fossil bones, considered by Cuvier to have belonged to an extinct species of hippopotamus, *H. medius*, are regarded by Gervais as the remains of the *Halitherium fossile*, an extinct Sirenian, of which order the manatee is a living representative. According to Professor Owen, the molar teeth also, both in the *Halitherium* and the *Felsinotherium*, another Sirenian, are constructed on the same pattern as those of the hippopotamus. It is proper to mention, however, that the same distinguished observer considers the teeth of the manatee and the *Prorastomus*, another extinct Sirenian, to be rather allied

to those of the tapir and Lophiodon; but this qualification does not really invalidate the supposed affinities between the Sirenia and the hippopotamus. For the Artiodactyla and the Perissodactyla are probably offshoots of a common stock, and hence we may expect to find in these two groups certain characters common to both, inherited from their Lophiodon and Coryphodon-like ancestors. The affinities of the teeth of the manatee with those of the tapir—the first an embryonic Artiodactyle, the second a generalized Perissodactyle—would be examples of the above view. I do not mean to imply that the manatee has necessarily descended directly from the hippopotamus, though extinct intermediate forms may in the future show this to be so, for possibly they may be the descendants of a common ancestor. To many such speculations may appear mere waste of time, we being unable, from the nature of the case, to experimentally prove or disprove the truth of the hypothesis advanced. It seems to me, however, that the only explanation of the structure of the living forms and of the petrified remains of the animals referred to in these observations, is the hypothesis of there being some generic connection between them."

VERRILLIA BLAKEI OR HALIPTERIS BLAKEI.—In the San Francisco *Mining and Scientific Press*, of August 9th, 1873, I published a "Description of a new species of Alcyonoid Polyp, which I placed in Cuvier's genus *Pavonaria*, and gave to it the specific name of *blakei*, in recognition of the courtesy of Dr. James Blake, who kindly furnished the specimens to describe. Subsequently, nine days after the publication of the first description as above, at a meeting of the California Academy of Sciences, held on the 18th day of August, I removed the species to a new sub-genus which I called *Verrillia*, in honor of Professor Verrill, of Yale College.

The characters of this sub-genus were defined as follows: "Polypidon linear-elongate, round or ovate in cross section. Axis round, slender, bony; polyyps arranged in two unilateral longitudinal series."

In *Nature* for November 6th, 1873, Dr. J. E. Gray, in an article entitled, "On the stick fish (*Osteocella septentrionalis*), and the habits of the sea pens," endeavored to make it appear that his genus and species, should have precedence, or the names so given by him should stand instead of mine, and gave what he called "the synonyma of these animals," presenting the sequence of dates of publication of the various papers, to show the priority of his own.

To this communication of Dr. Gray's I replied in a paper read before the California Academy of Sciences on the 16th of March, 1874, in which I reviewed the claims of Dr. Gray and his genus and species *Osteocella septentrionalis*, and denied the validity thereof, on the ground that "No description sufficiently accurate to be worthy of consideration can be made of the axial rods or bones alone, of this class of animal forms, nor can species be satisfac-

torily determined without the fleshy portion; nor in our present state of knowledge can the microscope determine these points."

In the *Zoölogical Record* for 1873, Vol. x (pp. 508-9), Dr. Lutken, editor of the department Cœlenterata, uses the following language: "Its generic identity with the Australian species (type of *Osteocella*), cannot be established so long as the latter is known only from the axial skeleton."

It will be seen by the quotation that Dr. Lutken practically sustains my position.

My description, read before the Academy, August 18th, 1873, was soon after reprinted in the *American Journal of Science and Art*, to which Professor Verrill added a foot-note as follows: "A recent examination of a specimen, convinces me that this species is most nearly allied to the *Halipteris christii* Kölliker (Koren and Dar., sp.), and probably ought to be referred to the same genus."

While regretting that the generic title with which I had associated the name of a justly distinguished naturalist, as well as a personal friend, must yield to precedence, I can only accept his suggestion, and place the species in Kölliker's genus *Halipterus*. The allusions herein to the late Dr. Gray are not intended to revive any differences of opinion as between that eminent authority and myself, but are incidentally introduced, being necessary to the continuity of the record of my own connection with the form which furnishes the title to this paper.

I was not aware until recently that I had not already called the attention of the Academy to Professor Verrill's note, which long-continued sickness in my family, and the pressure, until very recently, of official duties caused me to overlook.—*R. E. C. Stearns, Berkely, California, Nov. 9, 1881.*

DISCOVERIES OF THE U. S. FISH COMMISSION ON THE SOUTHERN COAST OF NEW ENGLAND.—In the *American Journal of Science* for October, Professor Verrill records the further discoveries made the past summer over a region about 42 miles wide, north and south, and 105 miles long, along the 100-fathom line off the southern coast of New England. It will be remembered that a remarkably rich fauna inhabits this region, which is near the edge of the Gulf stream, and at the edge of the descent to the ocean bottom. This richness in life seems to be due to the following reasons stated by Verrill: This region is subject to the combined effects of the Gulf stream on one side, and the cold northern current on the other, together with the gradual decrease in temperature in proportion to the depth. It is, therefore, probable that, at any given depth below 50 fathoms, the temperature is nearly the same at all seasons of the year. Moreover, there is, in this region, an active circulation of the water at all times, due to the combined currents and tides. The successive zones of depth represent successively cooler climates, more perfectly here

than near the coast. The vast quantities of free-swimming animals continually brought northward by the Gulf stream, and filling the water, both at the surface and bottom, furnish an inexhaustible supply of food for many of the animals inhabiting the bottom, and probably, directly or indirectly to nearly all of them.

A very large species of *Salpa*, often five or six inches long, occurs, both at the surface and close to the bottom, in vast quantities. These are eaten by star-fishes, actiniæ, etc. Pteropods also frequently occur in the stomachs of star-fishes, while Foraminifera furnish a large part of the food of many of the mud-dwelling species. The fishes, which are very abundant, and of many species, of which the file-fish is the most notable, find a wonderfully abundant supply of most excellent food in the very numerous species of crabs, shrimps and other Crustacea, which occur in such vast quantities that, not unfrequently, many thousands of specimens of several species are taken in a single haul of the trawl. Cephalopods are also abundant, and are eagerly devoured by the larger fishes, while others prey largely upon the numerous gastropods and bivalves. Many interesting fishes and mollusks were taken, some new to science, and of great interest; among the latter, the most remarkable is a new species of the tropical shell *Dolium* (*D. bairdii*), taken alive in 202 fathoms. *Dolium galea* extends northward to North Carolina. This southern form, with a large *Marginella*, an *Avicula*, and various other genera, more commonly found in southern waters, are curiously associated, in this region, with genera and species which have hitherto been regarded as exclusively northern, or even arctic; many of them having been first discovered in the waters of Greenland, Spitzbergen, Northern Norway, Jan Meyen Land, etc. A number of northern, mostly arctic, forms, not previously found south of Cape Cod, were also dredged.

DOES THE CROW BLACKBIRD EAT CRAYFISH?—Professor Beal, of the Iowa Agricultural College, asks this question in the November NATURALIST, his inquiry having been prompted by finding twenty-six gastroliths, or stomach-stones in a bird's "gizzard." The little incident which I will here record, I think will fairly settle this question with an affirmative answer. Crayfish inhabit many, doubtless most of the sloughs and wet places on our prairies; but I suppose the species to be identical with that in our rivers and streams, though they are sometimes spoken of as "land-crabs." Outside of where the water covers the ground, they dig holes into the soil, and in carrying out the dirt their holes are frequently built up like little chimneys, sometimes five or six inches above the surface. In a dry time they are compelled to descend so far, in order to keep in the water which is necessary to their existence, that they pass through our very deep black soil, and bring up the light-colored sand and fine gravel. In this way, they do a vast amount of work—generally, I believe, in

the night as they are seldom, if ever, seen so engaged. Passing a slough on the road, where these curious animals live, one day, three or four years ago, I saw a crow blackbird (*Quiscalus purpureus*), very hard at work in an apparent effort to grasp some object on the ground. In a moment it flew up and alighted on a fence-post, having in its bill a quite large crayfish. The bird held it by the back, as a boy grasps one in his fingers, to keep clear of the creature's pinchings claws. The captor had evidently done that sort of thing before, for it manifested none of the awkwardness of a "new hand" at the business. During the moment which elapsed before the bird flew off with its prey, I could distinctly see the crayfish's legs and feet in rapid motion, as it was feeling about for some object to grasp, or struggling to escape. The bird seemed to have quite a job in mastering the bundle of claws and legs, but it appeared determined not to abandon its lucky "find." I believe this incident may be taken as a very positive answer to Professor Beal's inquiry, though in regard to the food of any of our birds we need just such crucial tests as those which have been made by Professor Forbes, of Normal, Illinois. As to the presence of such an unusual number of these gastroliths, in the bird's stomach, it would require close observation to determine whether they were picked up and swallowed as aids to digestion, in grinding up the food; or were left for the same purpose after the other portions of the crayfish had passed along into the intestines. But these sagacious and active birds are so often seen walking in the shallow water, that their mission is no doubt the capture of all sorts of "small deer" which abide in there, as minnows, crayfish, worms, small frogs, &c. They are wise birds, and they walk about within a few feet of an observer, with a degree of coolness and nonchalance which is as amusing as it is unusual in our feathered visitants. In spring and fall they industriously follow a plow all day long, devouring all sorts of insects, and at such times become exceedingly tame. In fact, their behavior is exactly of that kind to indicate that they take it for granted that no one desires to hurt them. At all events, that is the case on my farm.—*Charles Aldrich, Webster City, Iowa, Nov. 10, 1881.*

WILD BIRDS RACING WITH THE CARS.—Several times I have noticed wild birds of different species flying along parallel with, and near a railroad train, in such a way as to suggest the idea that they were really trying to distance the iron horse! One day last spring I was coming east from Sioux City, Iowa, on the Illinois Central R. R., when my attention was attracted to a couple of birds which seemed to be making us a trial of their speed with the train. They were, as I supposed at the time, our smallest species of hawks—sharp, alert, powerful birds, possessed of a high degree of strength and endurance on the wing. They kept steadily on their course a dozen rods from

the train, for at least a mile and a half, but the train was too rapid for them, and they finally turned aside and went back in the direction whence they came. A strong head-wind was blowing at the time, and the birds at some moments seemed to sail squarely in its teeth without fluttering a wing. I watched them with much interest, and I did not think I could be mistaken in the belief that they were really trying to beat the train in the race. Horses and dogs frequently race with railroad trains, and possibly the instinct for sport and excitement may also exist in the wild birds.—*Charles Aldrich, Webster City, Iowa, Nov. 9, 1881.*

INFUSORIA IN DEW.—Mr. W. S. Kent states, in his Manual of the Infusoria, that he gathered in a very foggy day in Regent's Park a quantity of grass saturated with "dew," and found in every drop squeezed from the grass great numbers of infusoria of different genera, such as *Heteromita*, *Vorticella*, etc., with *Rotifer vulgaris* and other rotifers, and numerous *Amoebæ*, *Anguillula*, and various diatoms, the collection as a whole being indistinguishable from the ordinary microscopic fauna of a roadside pond.

ZOOLOGICAL NOTES.—The practical aspects of zoölogy must be appreciably felt in India, where it is reported that no fewer than 21,990 persons were killed during the year 1880 by snakes and tigers. The annual percentage of loss has increased during the past five years, the number of victims in 1876 not exceeding 19,273. It also appears that the white ant in India costs the government £100,000 a year for repairing wood-work, bridges, etc., caused by its depredations.—A preliminary report, by P. H. Carpenter, on the Comatulæ dredged by the U. S. Coast Survey, under the supervision of Mr. A. Agassiz, in the Gulf of Mexico, the Caribbean sea, and the east coast of the United States, appears in the Bulletin of the Cambridge Museum. The collection embraces forty new species of Comatulæ, the number known to inhabit the Caribbean sea alone being fifty-five; the genus being essentially a shoal-water one.—An additional case of supposed hybridity in birds is noticed by W. Brewster, in the Bulletin of the Nuttall Ornithological Club, for October. He thinks that *Helminthophaga leucobranchialis* and *H. lawrencei* are hybrids between *H. pinus* and *H. chrysoptera*. Hitherto it was not known to occur in any American birds, except among grouse and some of the swimming birds. Among the Passeres Trotter's hybrid swallow, and Ridgway's case of a supposed hybrid between *Helminthophaga pinus* and *Oporornis formosa*, have lately been added. Mr. Brewster thinks there are several additional doubtful species, which "show strong traces of a hybrid origin."—In the same journal, A. M. Frazer concludes that, instead of following the land, a large number of species migrate direct from Central America to the Mississippi valley, across the Gulf of Mexico, and the scarcity of these species in Southwestern Texas is thus

explained.—A new edition of Brehm's Thierleben, with 170 chromo-lithograph plates, is to be issued in 140 weekly parts, at 36 cents each, postpaid. B. Westermann & Co., of New York, are the agents in this country.—An annotated list of the birds of Nevada, by W. A. Hoffman, appears in the Bulletin of Hayden's U. S. Geological Survey, Vol. vi. It is prefaced by remarks on the distribution of vegetation in Nevada, as affecting that of the avi-fauna, and is accompanied by interesting profile views.—A valuable illustrated paper on the comparative anatomy and the histology of the brain, and more particularly of the *epiphysis cerebri* of Plagiostomes, Ganoids and Teleostei, by Dr. T. Th. Catter, gives us some apparently excellent drawings of the brains of *Raya clavata*, *Acanthias vulgata*, *Galeus canis*, *Acipenser sturio*, *Gadus morrhua*, *Cyclopterus lumpus*, and the common eel, which will be found very useful to naturalists in this country.—The *Zoölogischer Anzeiger*, for Nov. 14, contains a summary of new researches by Salensky, on the embryonal development of *Salpa*, and several articles on the intestinal worms.—Prof. Hæckel has gone to Ceylon on a scientific journey.—A new zoölogical station, to serve as a winter laboratory, and as an annex to the sea-side laboratory founded by Lacaze Duthiers at Roscoff, is to be opened at Banyuls-sur-Mer, on the Mediterranean. The building, says *Nature*, will be of considerable size, and the aquarium will be lighted by electricity.—An English adaptation of Claus' "Handbuch der Zoologie," by Mr. Adam Sedgwick, of Trinity College, Cambridge, with the addition of 500 to 600 drawings by Prof. Claus himself, is to be published by W. Swan, Sonnenschein & Co., London.—A hand-book of Vertebrate Dissection, by Prof. H. Newell Martin and William A. Moale, M.D., Part I, How to dissect a Chelonian, is announced as published by Macmillan & Co.

ENTOMOLOGY.¹

ON SOME CURIOUS METHODS OF CHALCID PUPATION.—In the course of two years' study of the Chalcididæ, I have met with several anomalies connected with pupation, which seem to be worthy of description, and to which, so far as I can learn, with a single exception, the attention of entomologists has not been called.

One of the most curious of these instances, and one which has excited the greatest interest among my entomological friends to whom I have shown the specimens, is the case of a larva of *Phoxopteris divisana* Walk., an oak-feeding Tortricid, which has been parasited by an Euplectrus. The species I have called in MS. *E. albitrophis* and the method of pupation is so similar to that of *E. comstockii*, graphically described by Mr.

¹ This department is edited by PROF. C. V. RILEY, Washington, D. C., to whom communications, books for notice, etc., should be sent.